

College of Education

- (i) APPLICANT: Alvarez, Vernon L.
- (ii) TITLE OF INVENTION: Antigen Binding Peptides (Abtides) From Peptide Libraries
- (iii) NUMBER OF SEQUENCES: 103
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 - (E) COUNTRY: USA
 - (F) ZIP: 10036
- (v) COMPUTER READABLE FORM:
 - (A) MEDIUM TYPE: Floppy disk
 - (B) COMPUTER: IBM PC compatible
 - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
 - (D) SOFTWARE: PatentIn Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 08/488,161
 - (B) FILING DATE: 07-JUN-1995
 - (C) CLASSIFICATION:
- (viii) ATTORNEY/AGENT INFORMATION: ~
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(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 38 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Gly Ile Ile Asn Ala Asn Asp Pro Leu Pro Phe Trp Phe Met Ser Pro
1 5 10 15
Tyr Thr Pro Gly Pro Ala Pro Ile Asp Ile Asn Ala Ser Arg Ala Leu
20 25 30
Val Ser Asn Glu Ser Gly
35

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- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 38 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Asp Leu Ser Arg Asn Leu Asp Phe Gly Arg Phe Leu Leu Tyr Asn Ala
 1 5 10 15
 Tyr Val Pro Gly Phe Thr Pro Thr Phe Ile Ser Leu Thr Ala Glu His
 20 25 30
 Leu Ser Ser Pro Lys Gly
 35

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 38 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Cys Gly Arg Ala Tyr Cys Leu Ser Gly Asn Tyr Asn Ile Phe Gly Ala
 1 5 10 15
 Leu Phe Pro Gly Val Ser Thr Pro Tyr Ala Asp Val Gly His Asp Asp
 20 25 30
 Ala Gln Ser Trp Arg Arg
 35

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 38 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Arg Cys Ser Pro Ile Trp Gly Ile Ser Tyr Pro Phe Gly Leu Leu Ser
 1 5 10 15
 Ser Asn Pro Gly Val Cys His Ser Ser Asp Ala Glu Thr Asn Ile Arg
 20 25 30

Asn Asp Ile Leu Thr Thr
35

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Gly His Ser Asn Tyr Cys Phe Val Ser Thr Leu Gly Met Pro Ile Val
1 5 10 15

Gly Phe Pro Ser Ile Asn Ala Arg Gly Leu Ile His Tyr Gly Gly Ser
20 25 30

Asp Pro Arg Leu Ala Ala
35

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 9 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Trp Gln Gly Thr His Phe Pro Tyr Thr
1 5

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Leu Val Ser Lys Asn Asp Ser Gly
1 5

(2) INFORMATION FOR SEQ ID NO:8:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 8 amino acids

(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Gly Ser Asp Asn Lys Ser Val Leu
1 5

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala Pro
1 5 10 15
Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg
20 25

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 6 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Met Tyr Xaa Xaa Leu His
1 5

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Leu Thr Gln Ser Ser Ala
35

(1) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Asn Pro Phe Thr Leu Ser
35

(1) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 38 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Gly Pro Ser Leu Ala Ser
35

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 38 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Thr Val Ala Thr Met His Asp Arg Leu His Ser Ala Pro Gly Ser Gly
1 5 10 15
Asn Leu Pro Gly Ser Tyr Asp Ile Lys Pro Ile Phe Lys Ala Gln Ser
20 25 30
Gly Ala Leu His Ser Thr
35

(2) INFORMATION FOR SEQ ID NO:15:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Ile Asp Met Pro Gln Thr Ala Ser Thr Met Tyr Asn Met Leu His Arg
1 5 10 15
Asn Glu Pro Gly Gly Arg Lys Leu Ser Pro Pro Ala Asn Asp Met Pro
20 25 30
Pro Ala Leu Leu Lys Arg
35

(2) INFORMATION FOR SEQ ID NO:16:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Arg Leu Gly Asn His Val Trp Arg Glu Gly Gly Gly Met Tyr Gln Gln
1 5 10 15
Leu His His Asn Phe Pro
20

(2) INFORMATION FOR SEQ ID NO:17:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Arg Asp Ser Ala Val Glu Asn Pro Ser Val Gly Gly Glu Ile Pro Met
1 5 10 15
Tyr Arg Tyr Leu His Gln Arg
20

(2) INFORMATION FOR SEQ ID NO:18:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Pro Val Gln Lys Glu Tyr Gly Phe Gly Met Ser Gly Ala Ser Met Ile
1 5 10 15
Arg Leu Leu Arg Glu Thr Pro
20

(2) INFORMATION FOR SEQ ID NO:19:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Gln Lys Gly Gly Pro Gly Leu Leu Leu Tyr Gly Gly Asp Ser Met Tyr
1 5 10 15
Ile Thr Leu His Glu Pro Gly
20

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 15 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

[illegible]

(2) INFORMATION FOR SEQ ID NO:21:

- (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Gly Met Tyr Ser Arg Leu His Ser Pro Ala
1 5 10

(2) INFORMATION FOR SEQ ID NO:22:

- (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

His Cys Pro Pro Thr Pro Glu Thr Ser Cys Ala Thr Gln Thr Ile Thr
1 5 10 15

Phe Glu Ser Phe Lys Glu Asn Leu Lys Asp Phe Leu Leu Val Ile Pro
20 25 30

Phe Asp Cys
35

(2) INFORMATION FOR SEQ ID NO:23:

- (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Arg Glu Pro Val Val Gly Gly Lys Pro Trp Cys Arg Gly Pro Gly Gly
1 5 10 15

Leu Arg Trp Arg Gly Cys Gly Lys Ser Gln Phe Asp Lys Ile Ile Thr
20 25 30

Leu Ser Arg Asp Asn Arg Arg Asp Lys Arg Pro

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 1
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Gly, Cys, Glu, or Val"

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 2
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Ala, Ser, Pro or Leu"

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 3
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Pro, Thr, His or Leu"

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 4
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Leu, Met, Gln, Gly, Ala, or Ser"

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 5
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Trp or Tyr"

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 6
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Ser, Cys, Lys or Thr"

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 7
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Glu, Ser, Cys, Asp, Val, or Arg"

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 8
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Asn, His, Lys, Ser or Glu"

(ix) FEATURE:

(A) NAME/KEY: Modified-site
 (B) LOCATION: 9
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Leu, His, Arg, Asn, Gln, Thr or Gly"

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(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 10
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Trp, Pro, Arg, Thr, or Asp"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 11
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Trp, Cys, Val, Leu, or Gly"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 12
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Ser, Thr, Met, or His"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 13
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Gly"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 14
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Ser, Ala, Gly, Asn, Gln, or His"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 15
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Trp, His, Gly, Ala, or Arg"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 16
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Gly, Thr, Glu, Pro, Val, or Trp"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 17
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Val, Phe, Trp, Lys, or Ala"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 18
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Lys, Gln, Asp, Glu, Arg, and Leu"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 19
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Arg, Phe, or Ser"

(ix) FEATURE:
 (A) NAME/KEY: Modified-site
 (B) LOCATION: 20
 (D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Pro, Ser, Ile, or His"

(ix) FEATURE:

THE UNIVERSITY OF CHICAGO

(A) NAME/KEY: Modified-site
(B) LOCATION: 22

(D) OTHER INFORMATION: /label= Xaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 23

(D) OTHER INFORMATION: /label= Xaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 24

(D) OTHER INFORMATION: /label= Xaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 25

(D) OTHER INFORMATION: /label= Xaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 26

(D) OTHER INFORMATION: /label= Xaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 27

(D) OTHER INFORMATION: /label= Yaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 28

(D) OTHER INFORMATION: /label= yaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 29

(D) OTHER INFORMATION: /label= Xaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 30

(D) OTHER INFORMATION: /label= Xaa

(A) NAME/KEY: Modified-site
(B) LOCATION: 31

(D) OTHER INFORMATION: /label= xaa

(A) NAME/KEY: Modified-site

(D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Pro, His, or Ala"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1 5 10 15
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
20 25 30
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
35 40

(2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 31 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
(B) LOCATION: 2
(D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Ser or Arg"

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
(B) LOCATION: 15
(D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Ser, Pro, Thr, or Ala"

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
(B) LOCATION: 17
(D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Val, Ala, Asp, Glu, or Gly"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Ser Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1 5 10 15
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
20 25 30

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Ser Phe Met Asp Tyr Phe Phe His Thr Pro Glu Pro Lys Pro Ala Gly
1 5 10 15

Tyr Pro Asn Ala Tyr Thr Asp Pro Lys His Pro Ala
20 25

(2) INFORMATION FOR SEQ ID NO:27:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Ser Ser Ser Ile Phe Asp Tyr Ala Pro Phe Ser Trp Gly Ser Ala Gly
1 5 10 15

Leu Ser Asn Ser Ser Ile Asn Val Phe Glu Arg Ser
20 25

(2) INFORMATION FOR SEQ ID NO:28:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Ser Ala Ser Leu Trp Asp Ala Leu Gly Gly Trp Thr Thr Ser Ala Val
1 5 10 15

Pro Ser Tyr Pro Arg Pro His Gln Thr Pro Gly Arg
20 25

(2) INFORMATION FOR SEQ ID NO:29:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

Ser Leu Gly Leu Pro Trp Ile Asp Val Phe Gly Arg Ser Ser Ala Glu
1 5 10 15

Pro Trp Pro Phe Gly Arg Thr Asn Leu Pro Arg Ser

20

25

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 27 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Ser Val His Gly Ala Phe Leu Asp Ser Phe Phe Pro Trp Ala Ala Asp
 1 5 10 15
 Gly Pro His Gly Arg Gly Arg Leu Thr Ser Phe
 20 25

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

Glu Glu Lys Gln Gly Gly Arg Trp Ser Thr Met Met Pro Arg Pro Trp
 1 5 10 15
 Cys His Glu Gly Gly Cys Gly Phe Leu Tyr Tyr Asp Ala Met Thr Lys
 20 25 30
 Pro Lys Thr Pro Pro Ile Met Arg Thr Ala Ala
 35 40

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Leu Pro Arg Pro Phe Asp Asp Ala Ser Trp Lys Leu Arg Ala Val Lys
 1 5 10 15
 Glu Ser Pro Asp Gly Cys Gly Phe Gly Ser Pro Leu Leu Phe Pro Pro
 20 25 30

Tyr Ser Gly Leu Pro Thr Phe Ser Ser Cys Asp
35 40

(2) INFORMATION FOR SEQ ID NO:33:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 39 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

Gly Ser Phe Glu Ser Ala Arg Gly Val Thr Cys Ile Gly Asn His Ser
1 5 10 15

Ile Gly Ala His Gly Cys Gly Pro Leu Arg Ser Tyr Ala Ser Phe Asn
20 25 30

Arg Gly Ser Gly Arg Arg His
35

(2) INFORMATION FOR SEQ ID NO:34:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

Asp Gln Ile Gly Ser Arg Pro Gln Thr Thr Ser Arg Ser Ile Ser Gly
1 5 10 15

Ser Trp Trp Glu Asn Ala Lys Thr Leu Trp Gln Gln Asp Tyr Ala Phe
20 25 30

Ser Ala Pro Asn Ala Ala
35

(2) INFORMATION FOR SEQ ID NO:35:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Leu Ser Asp Ala Trp Gly Asn Phe Thr Thr Ser Tyr Arg Asp Ser Ala

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(1) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 37 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

(2) INFORMATION FOR SEQ ID NO:37:

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

(2) INFORMATION FOR SEQ ID NO:38:

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

Trp Ser Ile Gly Thr His Thr Gly Pro Glu Gly Lys Phe Arg Ile Pro
1 5 10 15
Cys Asp Arg Ser Gly Cys Gly Gly Thr Thr Leu Thr His Gly Gly Leu
20 25 30
Asn Ser Ser Pro Thr Gly Gln His Glu Arg Pro
35 40

(2) INFORMATION FOR SEQ ID NO:39:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Asp Pro Cys Glu Asp Gly Tyr Trp Leu Ser Ser Val Gly Arg Ala Gly
1 5 10 15
Ala Ser Ile Arg Gly Cys Gly Ala Ile Arg Arg Ser Ser Arg Thr Leu
20 25 30
Thr Ala Glu Tyr Ser Thr Arg Ala Ser Asn His
35 40

(2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Gly Ser Lys Arg Ser Cys Trp Gly Thr Thr Ile Ser Asn Tyr Phe Arg
1 5 10 15
Pro Val Pro Glu Gly Cys Gly Ser Ala Ser Ser Ile Asn Pro Asn Thr
20 25 30
Asn Thr Gly Arg Leu Pro Ser Leu His Arg Gln
35 40

(2) INFORMATION FOR SEQ ID NO:41:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Ser Ser Ala Ser Ser Gly Cys Leu Gly Arg Ala Glu His Leu Asp Leu
1 5 10 15
Asp Ser Val Trp Gly Cys Gly Ser Gln Ala Asp Met Ser Arg Arg Tyr
20 25 30
Ser Pro Trp Tyr Gly Arg Pro Arg Thr Gly Val
35 40

(2) INFORMATION FOR SEQ ID NO:42:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Asn Val Met Trp Ser Ser Ser Lys Ala Gly Ile Arg Asp Cys Ser Gln
1 5 10 15
Val Pro Pro Gly Gly Cys Gly Pro Val Asn Arg His Arg Ala Ser Pro
20 25 30
Pro Leu Thr Pro Phe Arg His Gly Ser Ile Arg
35 40

(2) INFORMATION FOR SEQ ID NO:43:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

Pro Leu Thr Ser Gly Ser Ser Ser Glu Tyr Arg Asn Arg Asp Asp Cys
1 5 10 15
Pro Val Tyr Lys Tyr Ala Thr Asn Cys Pro Arg Leu Asn Phe Ser Pro
20 25 30
Ser Arg Tyr Ser Pro Phe
35

(2) INFORMATION FOR SEQ ID NO:44:

- (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 38 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Gly Asp Ala Tyr Gly Gly Ile Phe Ser Arg Pro Arg Gln Gly Leu Ala
 1 5 10 15
 Asp Ser Tyr Ile His Ala Ser Tyr Thr Gly Lys His Phe Phe Arg Gly
 20 25 30
 Pro Arg Pro Pro Thr Arg
 35

(2) INFORMATION FOR SEQ ID NO:45:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 38 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Ser Thr Cys Ile Gly Ala Glu Gly Glu Trp Lys Ser Phe His Asn Phe
 1 5 10 15
 Leu Gln Cys Arg Asp Ala Thr Ser Thr Ser Ser Ser Thr Leu Asp Pro
 20 25 30
 Thr Ala Leu Arg Phe Gly
 35

(2) INFORMATION FOR SEQ ID NO:46:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 38 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

Tyr Ser Ala Thr Leu Trp Asp Gln Phe Gly Ser Arg Gln Val Glu Leu
 1 5 10 15
 Trp Ser Asn Arg His Ala Ser Ser Ala Leu Pro Phe Ala Ser Arg Ala
 20 25 30
 Ser Val Leu Gly Ser Arg

(1) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 26 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

Pro Arg Gly Arg Lys Gly Thr Asp Pro Ser
20 25

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

Leu Pro Ser Lys Gly Asn Ser Gln Asp Arg Ser Asp
20 25

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 28 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

Ser Lys Thr Ser Asn His Asp Val His Ser Met Arg
20 25

-99-

008770" 6.2343460

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 28 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

Arg Ala Glu Leu Val Asn Trp Tyr Glu Trp Phe His Val Thr Ala Glu
1 5 10 15
Ala Glu Thr Pro Val Ile Asn Ser His Asn Met Thr
20 25

(2) INFORMATION FOR SEQ ID NO:51:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 43 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

Gly Ala Pro Val Trp Arg Gly Asn Pro Arg Trp Arg Gly Pro Gly Gly
1 5 10 15
Phe Lys Trp Pro Gly Cys Gly Asn Gly Pro Met Cys Asn Thr Phe Thr
20 25 30
Pro Ala Arg Gly Gly Ser Arg Asn Asn Gly Pro
35 40

(2) INFORMATION FOR SEQ ID NO:52:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 43 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

Gly Ser Ala Ser Ser Cys Phe Pro Asn Phe Thr Ala Arg Gly Val Thr
1 5 10 15
Val Gly Phe Phe Gly Cys Gly Ser Pro Ala His Pro Ala Ala Pro Arg
20 25 30
Val Leu Asn Pro Ala Thr Asp Phe Pro Ala Pro
35 40

(2) INFORMATION FOR SEQ ID NO:53:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

Val Phe Arg Arg Thr Ala Arg Ser Ser Arg Pro Ile Gly Ala Thr Val
1 5 10 15
Phe Pro Trp Tyr Gly Cys Gly Asn Ser Asn Asp Glu Thr Leu Pro His
20 25 30
His Asp Ser Pro Pro Ser Phe Phe Leu Gly Ala
35 40

(2) INFORMATION FOR SEQ ID NO:54:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 42 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

Asn Thr Cys Trp Thr Asp Leu Phe Trp His Gly Leu Pro Gly Gly Asp
1 5 10 15
Leu Pro Arg Asp Gly Cys Gly Leu Pro Ser Glu Leu Thr Thr His Pro
20 25 30
Ser Arg Glu Arg Arg Asp Ala Ser Glu Asn
35 40

(2) INFORMATION FOR SEQ ID NO:55:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 38 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

Ile Asp Trp Asn Trp Leu Glu Arg Gly Gln His Asn Arg Gly Tyr Leu
1 5 10 15
His Ser Phe Pro Asp Ala Lys Ser Gln Pro Thr Arg Gly Pro Arg Val

20

25

30

Ala Pro Asn Gly Asn Asp
35

(2) INFORMATION FOR SEQ ID NO:56:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 38 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

Gly Arg Gly Ser Asp Met Arg Glu His Trp Pro Trp Ser Met Pro Leu
1 5 10 15

Ile Leu Asp Gln His Ala Asn Asp Pro Ser Pro Arg Ala Gln Ser His
20 25 30

Tyr Tyr Ser His Pro Phe
35

(2) INFORMATION FOR SEQ ID NO:57:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

Val Ser Thr Gly Trp Ser Gly Thr Pro Arg Trp Cys Ala Pro Gly Gly
1 5 10 15

Lys Gln Gly Ser Gly Cys Gly Asn Gly Pro Arg Trp Thr Thr Leu Thr
20 25 30

Pro Asp Leu Gly Gly Thr Arg Lys Tyr Gly Pro
35 40

(2) INFORMATION FOR SEQ ID NO:58:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

Gly Ala Pro Leu Trp Cys Glu Lys Leu Ser Gly Thr Gly Ser Gly Gly
 1 5 10 15
 Phe Lys Trp Pro Gly Cys Gly Ser Gly Pro Thr Tyr Asn Thr Phe Thr
 20 25 30
 Pro Ala Arg Val Gly Ser Asp Asn Lys Trp Pro
 35 40

(2) INFORMATION FOR SEQ ID NO:59:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

Gly Pro Pro Val Trp Ser Ala Lys Ser Arg Trp Thr Gly Thr Gly Val
 1 5 10 15
 Leu Asn Trp Pro Gly Cys Gly Lys Val Pro Ser Cys Ser Thr Tyr Thr
 20 25 30
 Pro Ser Arg Asp Arg Ser Arg Lys Ser Asp Pro
 35 40 ~

(2) INFORMATION FOR SEQ ID NO:60:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

Gly Ser Ala Leu Leu Thr Ser Lys Gly Cys Val Arg Gly Pro Gly Gly
 1 5 10 15
 Leu Met Arg Pro Gly Cys Gly Asn Asp Arg Leu Gly Lys Ser Ser Thr
 20 25 30
 Tyr Ala His Gly Gly Trp Ile Lys Thr Gly Pro
 35 40

(2) INFORMATION FOR SEQ ID NO:61:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

Gly Ser Pro Val Trp Ser Gly Asp Asn Arg Trp Arg Gly Ser Ser Pro
1 5 10 15
Leu Lys Arg Pro Gly Cys Gly Asn Gly Ala Lys Cys Asn Thr Leu Lys
20 25 30
Asp Asn Arg Lys Asp Ser Arg Lys Thr Lys His
35 40

(2) INFORMATION FOR SEQ ID NO:62:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 42 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

Gly Pro Leu Leu Pro Gly Glu Ala Ala Val His Gly Ala Arg Gly Leu
1 5 10 15
Met Arg Ser Gly Cys Gly Asn Gly Pro Thr Trp Asn Arg Leu Thr Ala
20 25 30
Ala Cys Arg Asp Ser Arg Asn Lys Gly Pro
35 40

(2) INFORMATION FOR SEQ ID NO:63:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

Gly Ser Pro Val Trp Met Gly Ser Thr Arg Trp Thr Gly His Gly Trp
1 5 10 15
Phe Arg Ser Gln Gly Cys Gly Asn Val Pro Arg Thr Asn Ser Cys Ala
20 25 30
Pro Ala Gly Lys Asp Ser Gln Asn Lys Gly Pro
35 40

(2) INFORMATION FOR SEQ ID NO:64:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

Gly Ala Pro Val Trp Arg Gly Asn Arg Trp Cys Ser Asp Asn Gly Glu
1 5 10 15

Leu Glu Arg Pro Gly Cys Gly Tyr Gly Pro Arg Phe Asn Ile Leu Pro
20 25 30

Pro Gly Arg Gly Asn Ser Arg Lys Pro Ser Pro
35 40

(2) INFORMATION FOR SEQ ID NO:65:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

Gly Ser Ser Gly Trp Lys Val Lys His Arg Cys Gly Gly Pro Gly Thr
1 5 10 15

Leu Gln Arg Pro Gly Cys Gly Asn Leu Pro Leu Gly His Thr Phe Pro
20 25 30

Pro Thr Arg Gly Gly Ser His Met Glu Gly Ala
35 40

(2) INFORMATION FOR SEQ ID NO:66:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

Gly Pro Arg Ser Trp Met Gly Gln Pro Arg Gly Ser Asp Ala Gly Ser
1 5 10 15

Cys Lys Trp Ala Gly Cys Gly Asp Ala Pro Met Trp Arg Ala Ser Thr
20 25 30

Pro Gly His Gly Gly Pro Pro Asn Arg Gly Ser
35 40

(2) INFORMATION FOR SEQ ID NO:67:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

Glu Ala Leu Val Cys Arg Gly Lys Pro Pro Trp Ser Gly Pro Ala Gly
 1 5 10 15
 Leu Leu Trp Gln Gly Cys Gly Thr Gly Pro Val Ser Arg Thr Phe Thr
 20 25 30
 Ser Ala Gln Gly Arg Ser Arg Asn Lys Thr Ser
 35 40

(2) INFORMATION FOR SEQ ID NO:68:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

Gly Ala Pro Val Val Gly Asp Ile Leu Trp Cys Ser Gly Ala Arg Gly
 1 5 10 15
 Ala Lys Trp Pro Gly Cys Gly Lys Gly Pro Thr Asn Lys Thr Phe Ser
 20 25 30
 His Ser Arg Gly Gly Thr Gln Lys Ser Gly Leu
 35 40

(2) INFORMATION FOR SEQ ID NO:69:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

Gly Ala Pro Val Ser Arg Cys Lys Pro Ala Cys Gly Gly Phe Trp Gly
 1 5 10 15
 Val Asn Trp Pro Gly Cys Gly Asn Ala Ser Met Cys Lys Thr Phe Thr
 20 25 30

Asn Gly His Gly Val Ser Ser Asp Asn Gly His
35 40

(2) INFORMATION FOR SEQ ID NO:70:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

Gly Ala His Gly Tyr Lys Asn Gly Ser Thr Cys Thr Gly Leu Gly Gly
1 5 10 15

Trp Arg Cys Arg Gly Cys Gly Lys Gly Ala Met Cys Asn Asn Pro Ser
20 25 30

Pro Ala Gly Gly Ala Tyr His Asn Gln Gly Pro
35 40

(2) INFORMATION FOR SEQ ID NO:71:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 42 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

Gly Pro Gln Gly Ser Glu His Gln Cys Cys Ser Gly His Trp Gly Leu
1 5 10 15

Lys Phe Pro Gly Cys Gly Asn Gly Pro Ile Cys Asn Asn Phe Thr Ala
20 25 30

Leu Arg Gly Ala Ser Arg Lys Asn Gly Pro
35 40

(2) INFORMATION FOR SEQ ID NO:72:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

Gly Glu Pro Val Trp Cys Arg His Ser Gly Gly Arg Val Gln Gly Gly

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

Cys Ala Pro Met Trp Ser Gly Lys Pro Pro Trp Cys Val Gly Gly Gly
1 5 10 15
Val Lys Phe Arg Gly Cys Gly Asn Arg Pro Asp Cys Asn Ile Ile Thr
20 25 30
Pro Arg Leu Val Glu Ser Arg Asp Lys Ala Leu
35 40

(2) INFORMATION FOR SEQ ID NO:76:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

Ala Asp Pro Val Cys Ser Arg Lys Pro Asp Gly Gly Gly Leu Arg Gly
1 5 10 15
Leu Arg Trp Pro Gly Cys Gly Lys Gly Pro Ile Leu Tyr Asn Val Thr
20 25 30
Ala Ala Arg Gly Gly Ser Arg Asn Asn Gly Pro
35 40

(2) INFORMATION FOR SEQ ID NO:77:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

Gly Thr Arg Val Pro Pro Gly Phe Ala Leu Arg Gly Gly Arg Asp Gly
1 5 10 15
Leu Ser Trp Ala Gly Cys Gly Lys Ala Pro Ile Ser Lys Thr Tyr Thr
20 25 30
Ser Ala Arg Gly Arg Ser Arg Lys Lys Gly Ser
35 40

(2) INFORMATION FOR SEQ ID NO:78:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

030601000

His Gly Pro Glu Gln Phe Gln Glu Ile Glu Pro
35 40

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 42 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

Asp Arg Gly Gly Ser Cys Asn Gln Thr Leu
35 40

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 43 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

Ser Ala Arg Gly Gly Phe Pro Asn Lys Gly Leu
35 40

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:81:

Gly Ala Pro Leu Trp Gln Gly Asp Pro Ala Asp Glu Val Leu Gly Gly
 1 5 10 15
 Ser Met Ile Pro Gly Cys Gly Ile Gly Ala Leu Ser Gln Thr Phe Thr
 20 25 30
 Pro Thr Pro Gly Gly Ser Arg Lys Asn Val Thr
 35 40

(2) INFORMATION FOR SEQ ID NO:82:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 42 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:82:

Ala Gly Arg Glu Leu Arg Gln Asp Glu Gly Glu Gly Ala Gly Ala
 1 5 10 15
 Asp Val Ala Arg Leu Arg Glu Gly Pro Ile Cys Ser Thr Phe Thr Pro
 20 25 30
 Ala Arg Gly Gly Ser Cys Pro Ser Gly Leu
 35 40

(2) INFORMATION FOR SEQ ID NO:83:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 43 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:83:

Gln Ala Arg Val Ser Met Ala Ile Ser Cys Arg Ser Gly Pro Ser Asp
 1 5 10 15
 Leu Met His Gln Gly Cys Gly Tyr Gly Pro Arg Cys Asn Pro Asp Thr
 20 25 30
 Thr Asp Ser Gly Gly Ser His Thr Asn Thr Pro

(2) INFORMATION FOR SEQ ID NO:84:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:84:

Gly Asp Pro Glu Cys Arg Gly Lys Pro Arg Gly Arg Trp Thr Gly Ser
 1 5 10 15
 Leu Ala Cys Thr Gly Cys Gly Asn Gly Pro Asn Ser Lys Ile Cys Thr
 20 25 30
 Arg Ala Arg Gly Val Ser Arg Asn Lys Gly Pro
 35 40

(2) INFORMATION FOR SEQ ID NO:85:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:85:

Ser Thr Pro Gly Cys Ser Gly Tyr Ser Gly Ser Gly Asp Pro Arg Cys
 1 5 10 15
 Leu Thr Cys Thr Ala Cys Gly Asn Gly His Thr Arg Lys Thr Leu Thr
 20 25 30
 Pro Ala His Gly Arg Ser Thr His Lys Glu Pro
 35 40

(2) INFORMATION FOR SEQ ID NO:86:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 43 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:86:

Gly Gln Pro Glu Cys Arg Ile Thr Ser Gly Cys Cys Gly Thr Asp Gly
 1 5 10 15

Asn Lys Trp Leu Gly Cys Gly Lys Val Asp Met Cys Asn Thr Leu Asn
20 25 30

Pro Ala Val Gly Cys His Gly Thr Asn Gly Ser
35 40

(2) INFORMATION FOR SEQ ID NO:87:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 56 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:87:

CTGTGCCTCG AGBNNBNNBN NBNBNNBNN BNNBNNBNNB NNBNNBNNBN CCGCGG

56

(2) INFORMATION FOR SEQ ID NO:88:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 56 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:88:

CTGTGCTCTA GAVNNVNNVN NVNNVNNVNN VNNVNNVNNV NNVNNVNNVN CCGCGG

56

(2) INFORMATION FOR SEQ ID NO:89:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 49 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:89:

TCGAGBNNBN NBNBNNBNN BNNBNNBNNB NNBNNBNNBN NBNCCGCGG

49

(2) INFORMATION FOR SEQ ID NO:90:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 49 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:90:

CTAGTVNNVN NVNNVNNVNN VNNVNNVNNV NNVNNVNNVN NVNCCGCGG

49

(2) INFORMATION FOR SEQ ID NO:91:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 38 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 5
- (D) OTHER INFORMATION: /label= Xaa

/note= "Xaa = Ser or Arg"

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 18
- (D) OTHER INFORMATION: /label= Xaa

/note= "Xaa = Ser, Pro, Thr, or Ala"

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 20
- (D) OTHER INFORMATION: /label= Xaa

/note= "Xaa = Val, Ala, Asp, Glu, or Gly"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:91:

Ser His Ser Ser Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1 5 10 15

Xaa Xaa Ala Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
20 25 30

Ser Arg Pro Ser Arg Thr
35

(2) INFORMATION FOR SEQ ID NO:92:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 81 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:92:

GTGTGTCTCG AGNNNBNNBN NBNNBNNBNN BNNBNNBNNB NNBNNBNNBN NBNNBNNBNN

60

BNNBNNBNNB NNBACGCCA N

81

(2) INFORMATION FOR SEQ ID NO:93:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 66 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:93:

GTTGTGTCTA GAVNNVNNVN NVNNVNNVNN VNNVNNVNNV NNVNNVNNVN NVNNVNNVNT 60
GGCGTN 66

(2) INFORMATION FOR SEQ ID NO:94:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 74 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:94:

TCGAGNNBNB NBNBNNBNBN BNNBNNBNBN NBNBNNBNBN NBNBNNBNBN BNNBNNBNBN 60
NNBNNBNACG CCAN 74

(2) INFORMATION FOR SEQ ID NO:95:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 59 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:95:

CTAGAVNNVN NVNNVNNVNN VNNVNNVNNV NNVNNVNNVN NVNNVNNVNN VNTGGCGTN 59

(2) INFORMATION FOR SEQ ID NO:96:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 44 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
 (B) LOCATION: 4

(D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Ser or Arg"

(ix) FEATURE:

(A) NAME/KEY: Modified-site

(B) LOCATION: 25

(D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Tyr, His, Asn or Asp"

(ix) FEATURE:

(A) NAME/KEY: Modified-site

(B) LOCATION: 27

(D) OTHER INFORMATION: /label= Xaa
/note= "Xaa = Ile, Met, Thr, Asn, Lys, Ser, or Arg"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:96:

His Ser Ser Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1 5 10 15
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ala Xaa Xaa Xaa Xaa Xaa Xaa
20 25 30
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ser Arg
35 40

(2) INFORMATION FOR SEQ ID NO:97:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 82 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:97:

GTGTGTCTCG AGNNNBNNBN NBNNBNNBNN BNNBNNBNNB NNBNNBNNBN NBNNBNNBNN 60
BNNBNNBNNB NNBGGTTGTG GT 82

(2) INFORMATION FOR SEQ ID NO:98:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 81 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:98:

GTTGTGTCTA GAVNNVNNVN NVNNVNNVNN VNNVNNVNNV NNVNNVNNVN NVNNVNNVNN 60
VNNVNNVNNV NNACCACAAC C 81

(2) INFORMATION FOR SEQ ID NO:99:

[illegible]

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:99:

(2) INFORMATION FOR SEQ ID NO:100:

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:100:

(2) INFORMATION FOR SEQ ID NO:101:

(ii) MOLECULE TYPE: peptide

(A) NAME/KEY: Modified-site
(B) LOCATION: 4
(D) OTHER INFORMATION: /label= Xaa
Xaa = Ser or Arg"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:101:

Arg

(2) INFORMATION FOR SEQ ID NO:102:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 69 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:102:

GGSGCSCCSG TSTGSAGSGG SAASCCSCGS TGSAGSGGSC CSGGSGGSTT SAASTGSCCS 60
GGCTGCGGG 69

(2) INFORMATION FOR SEQ ID NO:103:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 69 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:103:

SGGSCCSTTS TTSCGSGASC CSCCSCGSGC SGGSGTSAAS GTSTTSCASA TSGGSCCSTT 60
CCCGCAGCC 69